

THE VARIATIONS OF *LATHYRUS PALUSTRIS* IN EASTERN AMERICA.

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THE circumpolar *Lathyrus palustris* L. has long been very perplexing to the student of systematic and geographic botany. As represented in many regions it occurs in two or more forms which by some authors have been treated as varieties, by others as distinct species. Torrey & Gray, for instance, recognized in America seven pronounced variations of *L. palustris*, besides *L. myrtifolius* Muhl. which was afterward treated, by Dr. Gray at least, as a variety of *L. palustris*.

In eastern America there are three primary variations of *L. palustris*. One, a plant of comparatively coarse habit, varies from 5 (rarely only 3)-12, averaging 7 dm. in height, has coarse glabrous ordinarily more or less winged stems, excluding the wings 1.5-3 (averaging 1.8) mm. in diameter below the lowest peduncle; 2-5 pairs of elliptic to broadly lanceolate or oblanceolate glabrous leaflets 3-8.5 cm. long, and 3-5 (rarely 8) large purple flowers 1.6-2.5 cm. long. This plant in its chief characters matches Old World material of *L. palustris* and is the form taken by Seringe, Reichenbach, Rouy & Foucaud, Ascherson & Graebner, and other critical students of the European flora as true *L. palustris* (var. *genuinus* Grenier & Godron; var. *latifolius* Lambertye).

The second striking variation of *L. palustris* is a much smaller plant with the low glabrous slightly winged or wingless stems 1-6 (rarely 8) dm., averaging 3.7 dm., high, and below the lowest peduncle only 0.5-1.5 (average 0.9) mm. in diameter. This plant has ordinarily 2 or 3 (rarely 4 or 5) pairs of linear or lanceolate glabrous leaflets, and its 2-5 flowers are about 1.5 cm. long. This, as shown by comparison with Seringe's material in the DeCandolle Herbarium at Geneva, is *L. palustris*, var. *linearifolius* Seringe (*L. viciaeformis* Wallr.).

The third primary variation of *L. palustris* is var. *myrtifolius* (Muhl.) Gray, by some authors treated as a species, *L. myrtifolius* Muhl. In this extreme the stems are as slender as in var. *linearifolius* and commonly wingless, but as tall as in typical *L. palustris*; the 2 or 3 pairs of elliptical to broadly lanceolate leaflets are mostly

2-4 cm. long; and the 3-9 flowers are as small as in var. *linearifolius* or even smaller (1-1.5 cm. long). Although var. *myrtifolius* is specifically separated by some authors from *L. palustris* by its wingless stems, shorter leaflets and smaller flowers, these are all characters which are so subject to variation that no one of them alone is constant enough for diagnostic use. The nearly wingless stem of var. *myrtifolius*, though a reasonably good character when taken in connection with the other points, occurs also in numerous specimens with the low stature and elongate linear-lanceolate leaflets of var. *linearifolius* and even in the coarser larger-flowered *L. palustris* itself. In fact, the pubescent extreme of the large-flowered *L. palustris*, which commonly has the stem somewhat winged, was treated by the late Theodore G. White in his *Revision of the Genus Lathyrus*¹ as a variety of the "wingless"-stemmed *L. myrtifolius*, his *L. myrtifolius macranthus*, having the "flowers large (2-2.5 cm. long)" and thus clearly opposed to the statement in his key that *L. myrtifolius* has the "flowers less than 1-5 [1.5] cm. long."

Not only do the flowers vary in size and the stems in stoutness and the degree to which the wings are developed, but the number, outline, and length of the leaflets are perplexingly variable, so that, as already stated, no one of these characters can be relied upon to distinguish *L. myrtifolius* as a species; but an examination of nearly 200 American specimens of the group has shown that, though none of these characters can be taken as final, they do occur in combinations which taken together mark off some very well defined varieties. Three of these varieties are characterized above. A fourth, var. *pilosus* (Cham.) Ledeb. was taken up in the 7th edition of Gray's Manual as a plant resembling typical *L. palustris* in stature, foliage, and large flowers, but differing in being pubescent. This large-flowered plant with large usually broad leaflets, the *L. myrtifolius*, var. *macranthus* of White, was identified during the revision of the Manual by comparison with Asiatic material labeled *L. palustris*, var. *pilosus* and with the figure so called in Reichenbach's *Icones Flora Germanicae* (xxii. t. mmeclvii, fig. v). But subsequently a difficulty has arisen through the discovery that much of the plant referred in the Manual to var. *linearifolius* is quite as pilose as the coarser plant taken to be var. *pilosus*; and examination of the original description of *L. pilosus*

¹ T. G. White, Bull. Torr. Bot. Cl. xxi. 444-458 (1894).

Chamisso, upon which Ledebour based his var. *pilosus*, shows that he had, not the plant with broad leaflets which has been generally identified with var. *pilosus*, but the pubescent extreme of var. *linearifolius*. Chamisso's description reads:

"LATHYRUS PILOSUS n. sp. Proximus *palustri*, gracilior tenuiorque, et omnium partium, praeter corollas glabras et forse legumen deficiens, pilositate diversus.—Pilosus, caule gracili tetragono bialato ad nodos haud flexuoso, foliis 2-4-jugis, foliolis linearibus," etc.¹

Chamisso's plant was from "portum Petro-Pauli Kamtschatcae," and it is interesting to find that material from Petropaulovskii, Kamchatka, and from Amur, Manchuria and Japan differs consistently from the European var. *linearifolius* in being pubescent, and that this pubescent Kamchatkan plant extends across to Alaska and down the Pacific coast at least to Oregon. On the Atlantic coast it is the common slender plant of meadows and damp or even dry situations (often brackish) from Labrador to Connecticut.

The var. *linearifolius* as treated in the 7th edition of Gray's Manual contained not only the slender pubescent plant with linear or lanceolate leaves (the plant just shown to be the true var. *pilosus*) but also a glabrous plant which, upon further comparison, the writer is unable to distinguish from the true glabrous var. *linearifolius* of Seringe. As represented in the Gray Herbarium, the glabrous var. *linearifolius* seems to be confined in America to the St. Lawrence Basin and adjacent territory, occurring from Minnesota and western Ontario to the vicinity of Quebec.

The large plant, which in the Manual is called var. *pilosus* and which has been passing both in Asia and Europe under that name, stands to typical *L. palustris* in the same relation as does true var. *pilosus* to var. *linearifolius*. The large pubescent plant is as tall and coarse as true *L. palustris*, has similar foliage and large flowers and differs from it only in the pubescent stems, leaves, calyx, and pods. This was the *L. palustris* η of Torrey & Gray, recently redescribed as *L. myrtifolius macranthus* White, from Lubec, Maine. In Mr. White's characterization emphasis is put upon the wingless stem, but this character is not a constant one, as shown by other pubescent plants with broad leaflets and large flowers from the coast of Maine and the Maritime Provinces. This large plant, Mr. White's *L. myrtifolius*

¹ Cham. Linnaea, vi. 548 (1831).

macranthus, is frequent in rich gravelly thickets along the coast from the lower St. Lawrence and western Newfoundland to York County, Maine, extending up the St. Lawrence system to Michigan; and, like var. *pilosus*, it reappears on the Pacific coast from Oregon to Alaska, crossing thence to eastern Asia, where it occurs at least in Amur, Manchuria, and Japan. In Germany an extreme of *L. palustris* has been reported under the name var. *pilosus* as "selten," but judging from the illustration given by Reichenbach the plant which reaches Germany is nearer the broad-leaved plant here under discussion, and, as far as the writer can find, this plant has no name except that given it by Mr. White under *L. myrtifolius*.

The conclusions reached in this study may be summarized in the following synopsis.

* Plant comparatively stout, the winged or sometimes wingless stem 5 (rarely only 3)–12 dm. high, excluding the wings 1.5–3 mm. in diameter below the lowest peduncle: the middle leaves with 2–5 pairs of elliptic to lanceolate or oblanceolate leaflets 3–8.5 cm. long and 7–23 mm. wide: peduncles 3–5 (rarely 8)–flowered: flowers 1.5–2.5 cm. long.

L. PALUSTRIS L. Stems, leaves, etc., glabrous.—Sp. Pl. 733 (1753).—Lower St. Lawrence River, Quebec, to Manitoba, south to York County, Maine, Lake Champlain, Vermont, northern and western New York, northern Ohio, Illinois, and Wisconsin; Oregon; also Eurasia. The following eastern specimens are considered typical. QUEBEC: St. Lawrence River, below Quebec, July 9, 1905, *J. R. Churchill*. MAINE: Van Buren, 1881, *Kate Furbish*; gravelly shore of Aroostook River, Fort Fairfield, Sept. 9, 1896, and Masardis, Sept. 8, 1897, *Fernald*; river-thicket, Presque Isle, July 14, 1902, *Williams, Collins and Fernald*; margin of Meduxnekeag River, Houlton, Aug. 12, 1909, *Fernald*, no. 1956; low thicket back of Wells Beach, July 22, 1898, *Kate Furbish*, July 23, 1898, *Fernald*; Ogunquit Beach, Wells, June, 1898, *Kate Furbish*. VERMONT: Garden Island, Lake Champlain, June 7, 1881, *E. & C. E. Faxon*; lake shore, North Hero, August 20, 1904, *E. Brainerd*. NEW YORK: Niagara Falls, 1821, *Torr. & Gray Fl.* OHIO: Huron River, Erie County, May 31, 1895, *E. L. Moseley*. WISCONSIN: Milwaukee, *Lapham*. ILLINOIS: Chicago, *Babcock*. ONTARIO: Michipicoten River, *Loring*. MANITOBA: Brandon, July 18, 1896, *J. Macoun*, no. 12,528.

Var. **macranthus** (T. G. White) n. comb. Similar, but stem, leaves, calyces and pods finely pubescent.—*L. palustris* η, *Torr. & Gray, Fl. i. 276 (1838)*. *L. myrtifolius macranthus* T. G. White, *Bull. Torr. Bot. Cl. xxi. 448 (1894)*. *L. palustris*, var. *pilosus* of various authors, not Ledeb.—Lower St. Lawrence River, Quebec, and western Newfoundland to York County, Maine, west chiefly along the

Great Lakes to Michigan; Alaska to Oregon; also eastern Asia and apparently rarely in Europe. Among the eastern American specimens examined the following are characteristic. NEWFOUNDLAND: Chimney Cove, north of Bay of Islands, 1893, *Waghorne*. QUEBEC: rich gravelly thicket by the River St. Lawrence, *Rivière du Loup*, August 3, 1902, *Williams & Fernald*; between Baldé and the Baie des Chaleurs, Bonaventure River, August 5-8, 1904, *Collins, Fernald & Pease*. NOVA SCOTIA: damp soil near edge of pond, near Pictou, July 12-18, 1901, *Howe & Lang*, no. 470; Sable Island, August 3, 1899, *J. Macoun*, no. 21,195. MAINE: Low ground, Cutler, July 3, 1902, *Kennedy* and others; Wells Beach, Wells, July 28, 1890, *Kate Furbish*. NEW YORK: edge of woods, Murray Island, Jefferson County, July 4, 1902, *Robinson & Maxon*, no. 95. MICHIGAN: near Alpena, July 13, 1895, *C. F. Wheeler*.

* * Plant comparatively slender, the winged or wingless stem 1-6 (very rarely 8) dm. high, 0.5-1.5 mm. in diameter below the lowest peduncle: the middle leaves with 2 or 3 (rarely 4 or 5) pairs of linear, lanceolate or narrowly oblong leaflets 2.5 (rarely only 1.5)-5.5 cm. long and 1.5-9 mm. wide: peduncles 2-5-flowered: flowers 1.3-1.8 cm. long. (Commonly well marked plants, but in their coarser and larger-leaved forms passing unquestionably to the members of the preceding and the following groups.)

Var. *LINEARIFOLIUS* Seringe. Stems, leaves, etc. glabrous.—Seringe in DC. *Prodr.* ii. 371 (1825). *L. viciaeformis* Wallr. *Sched. Crit.* 388 (1822).—Seen by the writer only from the St. Lawrence Basin and adjacent territory, and from Eurasia. The following American plants are characteristic. QUEBEC: vicinity of Montmorenci Falls, July 14, 1905, *J. Macoun*, no. 66,818. NEW YORK: northern New York, *Torr. & Gray Fl.* ONTARIO: Michipicoten River, *Loring*. MINNESOTA: Willmar, Kandiyohi County, July, 1892, *W. D. Frost*.

Var. *PILOSUS* (Cham.) Ledeb. Similar, but stems, leaves, calyces, and pods pubescent.—Fl. Ross. i. 686 (1842). *L. pilosus* Cham. *Linnaea*, vi. 548 (1831).—Meadows and swamps (often brackish) or even in dry situations, Labrador to Connecticut and probably slightly southward,¹ Alaska to Oregon; also Kamchatka and eastern Siberia to Amur and Japan. The following among many eastern American specimens are characteristic. LABRADOR: sandy barrens, Blanc Sablon, July 31, 1910, *Fernald & Wiegand*, no. 3645 (the most dwarf extreme, plants only 1-1.6 dm. high, the leaflets only 1.5-2.7 cm. long). NEWFOUNDLAND: gravelly shore, Port Saunders Harbor, August 6, 1910, grassy field overlying limestone rocks, Cow Head, July 22, 1910, *Fernald & Wiegand*, nos. 3644, 3643. QUEBEC: Seven Islands, Saguenay County, August 14, 1907, *C. B. Robinson*, no. 913; alluvial soil, mouth of Port Daniel River, July 30, 1902, seashore sands,

¹ It is probable that the Long Island *L. palustris*, which the writer has not seen, belongs to this common coastal variety.

New Carlisle, July 27, 1902, mouth of Bonaventure River, July 31, 1902, *Williams & Fernald*. NOVA SCOTIA: island and intervale-meadow, Aspy Bay, Cape Breton Island, July 10 and 25, 1909, *J. R. Churchill*; Baddeck, Cape Breton Island, July 12, 1898, *J. Macoun*; Canso, July 11 and 27, 1901, *J. Fowler*. MAINE: damp thicket near the sea, Moose Island, Passamaquoddy Bay, July 14, 1909, *Fernald*, no. 1959; Meadow, Pembroke, July 6, 1909, *Fernald*, No. 1955; in humus on rocky bank, Cutler, July 6, 1902, *Kennedy* and others. MASSACHUSETTS: Ipswich, *Wm. Oakes*; Topsfield, *C. N. S. Horner*; Cambridge, *Wm. Boott* and others; Dorchester, June 1, 1884, *J. R. Churchill*; dry open field, Polpis, Nantucket, June 3, 1900, *M. A. Day*, no. 52. RHODE ISLAND: brackish meadow, Middletown, June 19, 1903, *B. L. Robinson*.

* * * Plant comparatively slender, the wingless or slightly winged stem 0.3–1 m. high, 0.7–1.5 mm. in diameter below the lowest peduncle; the leaves with 2 or 3 pairs of ovate, elliptical or broadly lanceolate leaflets 2–4 cm. long and 6–17 mm. wide: peduncles 3–9-flowered: flowers 1–1.5 cm. long.

Var. *MYRTIFOLIUS* (Muhl.) Gray. Stem, leaves, etc. glabrous.—*Man. ed. 2*, 104 (1856). *L. myrtifolius* Muhl. in *Willd. Sp. iii. 1091* (1803). *L. stipulaceus* Le Conte in *Torr. Cat. Pl. N. Y. 92* (1819).—Quebec to Wisconsin, south to New Jersey, Pennsylvania, Ohio, and Indiana; and reported as occurring westward to Manitoba and south to North Carolina and Tennessee.¹ The following specimens are representative. QUEBEC: bank of St. Lawrence River below Quebec, July 9, 1905, *J. R. Churchill*. ONTARIO: Ottawa, August 10, 1894, *J. Macoun*, no. 4525. NEW YORK: swampy sandy pasture, border of Oneida Lake, Lenox, June 20, 1901, *J. V. Haberer*, no. 213; Seneca Lake, July 12, 1834, *A. Gray*; Penn Yan, *Sartwell*; Rochester, June 24, 1858, *Wm. Boott*; Niagara Falls, *Macrae*. NEW JERSEY: Bergen County, 1862, *D. C. Eaton*. OHIO: Enterprise, Erie County, July 5, 1894, *E. L. Moseley*. INDIANA: along Grand Calumet River, Miller, Lake County, June 29, 1897, *Agnes Chase*. MICHIGAN: Port Huron, July 8, 1897, *C. K. Dodge*. WISCONSIN: Milwaukee, *Lapham*.

GRAY HERBARIUM.

¹ Mr. T. G. White included in the synonymy of *L. myrtifolius* in his *Revision of the Genus Lathyrus*, *L. altaicus* Ledeb. and *L. decaphyllus*, var. *minor* Hook. & Arn. There must have been some misinterpretation in the matter, for *L. altaicus*, a plant of the Altai Mts. of Siberia, was described by Ledebour "with leaflets pubescent beneath....peduncles 2–4-flowered....legumes densely villous-pubescent"; while *L. decaphyllus*, var. *minor*, coming from California, is apparently not referable to the eastern *L. palustris*, var. *myrtifolius*.